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UNITED STATES ENVIRONMENTAL PROTECTION AGENCYREGION VIII
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Mr. Frazer Lockhart
U.S. Department of Energy
Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

Dear Mr. Lockhart:

EPA has recently become aware of several problems associated with aquatic toxicity testing for environmental evaluations. If not corrected, these problems will render the toxicity data unusable and interpretations of water quality will be hampered. It is not clear to us whether the problems are isolated incidents or are inherent in every operable unit in which toxicity testing is planned. We expect DOE to evaluate the magnitude of the problem and to make changes where appropriate. The specific problems are as follows:

1. When samples are collected for toxicity testing, simultaneous collection of water chemistry samples is not always accomplished. It will be impossible to determine the cause of any toxicity results without adequate chemical analyses of the water being tested.

2. Flow measurements are not taken when the samples for toxicity testing are collected. Without flow measurements, estimates of contaminant loading can't be determined and the effect of a particular source of contamination on the stream system can not be evaluated.

3. Lower detection limits for metal analyses of water samples may be necessary to evaluate potential toxicity indications. This is particularly true for copper, cadmium, and silver analyses. Enclosed please find Table 1, a list of detection limits recommended by EPA for water samples taken concurrently with toxicity testing samples.

4. Total organic carbon (TOC) is not always included in the list of chemical analysis parameters. TOC is an important component in the aquatic environment that binds up select metals. TOC analysis should be conducted on each sample collected for toxicity testing.

no lab responsibility

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The appropriate modifications to the environmental evaluation program must be made expeditiously to avoid problems in data interpretation. We encourage DOE to contact Bonnie Lavelle of EPA at (303) 294-1067 to discuss the details of how and when the necessary corrections will be made.

Sincerely,

Martin Hestmark

Martin Hestmark, Manager
Rocky Flats Project

Enclosure ,

cc: Gary Baughman, CDH
Bruce Thatcher, DOE
Larry Woods, EG&G
Bruce Hope, EG&G

Table 1. USEPA⁽¹⁾ Methods of Analysis and Desired Detection Limits for Analytes Commonly Measured by Region VIII.

<u>Variable, Units</u>	<u>USEPA Method</u>	<u>Detection Limit Required</u>
Temperature, Deg. C	EPA 170.1	0.5
Specific conductance, umhos/cm	EPA 120.1	1
pH, units	EPA 150.1	0.1
Alkalinity, mg/l	EPA 310.1	1
Dissolved Organic Carbon (a), mg/l	EPA 415.1	2
Calcium, Dissolved (b), mg/l	EPA 200.7	0.05
Magnesium, Dissolved, mg/l	EPA 200.7	0.01
Sulfate, Dissolved, mg/l	EPA 375.4	5
Ammonia, Dissolved, mg/l	EPA 350.1	0.2
Nitrite + Nitrate, Diss., mg/l	EPA 353.2	0.04
Phosphates, Diss. as P, mg/l	EPA 365.1	0.01
Residue, Non-filterable, mg/l	EPA 160.2	4
Aluminum, Tot. Rec. (c), ug/l	EPA 200.7	45
Aluminum, Dissolved, ug/l	EPA 200.7	45
Iron, Dissolved, ug/l	EPA 200.7	3
Iron, Tot. Rec. (c), ug/l	EPA 200.7	10
Manganese, Diss., ug/l	EPA 200.7	10
Manganese, Tot. Rec., ug/l	EPA 200.7	10
Antimony, Tot. Rec., ug/l	EPA 204.2	3
Antimony, Dissolved, ug/l	EPA 204.2	3
Arsenic, Tot. Rec., ug/L	EPA 206.2	2
Arsenic, Diss., ug/L	EPA 206.2	2
Barium, Tot. Rec., ug/l	EPA 200.7	2
Beryllium, Tot. Rec., ug/l	EPA 210.2	0.2
Beryllium, Dissolved, ug/l	EPA 210.2	0.2
Cadmium, Tot. Rec., ug/l	EPA 213.2	0.5
Cadmium, Diss., ug/l	EPA 213.2	0.5
Copper, Tot. Rec., ug/l	EPA 200.7	6
Copper, Diss., ug/l	EPA 200.7	6
Chromium, Tot. Rec., ug/l	EPA 200.7	7
Chromium, Diss. (3+), ug/l	EPA 200.7	7
Chromium, Hexavalent, ug/l	EPA 218.5	5
Cobalt, Tot. Rec., ug/l	EPA 200.7	7
Lead, Tot. Rec., ug/l	EPA 239.2	1
Lead, Diss., ug/l	EPA 239.2	1
Mercury, Tot. Rec., ug/l	EPA 245.1	0.2
Mercury, Dissolved, ug/l	EPA 245.1	0.2
Molybdenum, Tot. Rec., ug/l	EPA 200.7	8
Molybdenum, Dissolved., ug/l	EPA 200.7	8

Table 1 (extended). USEPA⁽¹⁾ Methods of Analysis and Desired Detection Limits for Analytes Commonly Measured by Region VIII.

<u>Variable, Units</u>	<u>USEPA Method</u>	<u>Detection Limit Required</u>
Nickel, Tot. Rec., ug/l	EPA 249.2	1
Nickel, Tot. Rec., ug/l	EPA 249.2	1
Potassium, Dissolved, ug/l	EPA 200.7	100
Silica, (SiO ₂) Diss., ug/l	EPA 200.7	58
Silver, Tot. Rec., ug/l	EPA 272.2	0.2
Silver, Dissolved, ug/l	EPA 272.2	0.2
Sodium, Dissolved, ug/l	EPA 200.7	29
Thallium, Tot. Rec., ug/l	EPA 279.2	1
Thallium, Dissolved, ug/l	EPA 279.2	1
Tin, Tot. Rec., ug/l	EPA 282.1	800
Vanadium, Tot. Rec., ug/l	EPA 200.7	8
Zinc, Tot. Rec., ug/l	EPA 200.7	2
Zinc, Diss., ug/l	EPA 200.7	2

(1) Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020, Revised March 1983. Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH.

(a) The samples for Dissolved Organic Carbon" will be field-filtered prior to analysis. Report as "Dissolved Organic Carbon."

(b) "Total Recoverable Metals" means the concentration of metals in an unfiltered sample following treatment with hot dilute mineral acid as described in Section 4.1.4 of "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Revised March 1983. Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH.

(c) "Dissolved Metals" means those metals which will pass through a 0.45 micron membrane filter. The specific method of sample treatment and analysis is defined in Section 4.1.1 of "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Revised March 1983. Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH.